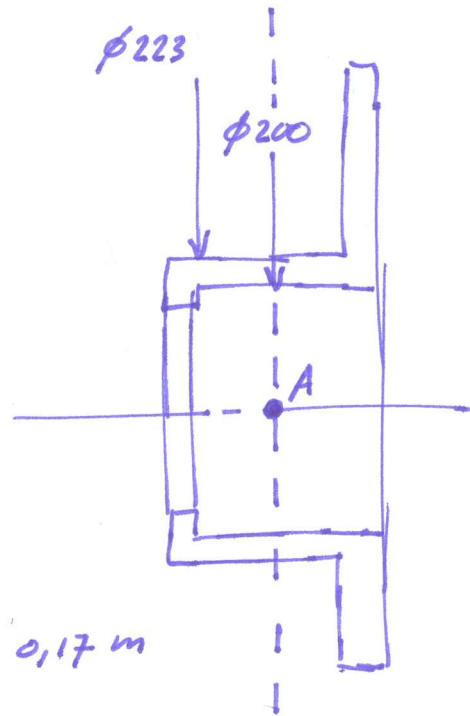
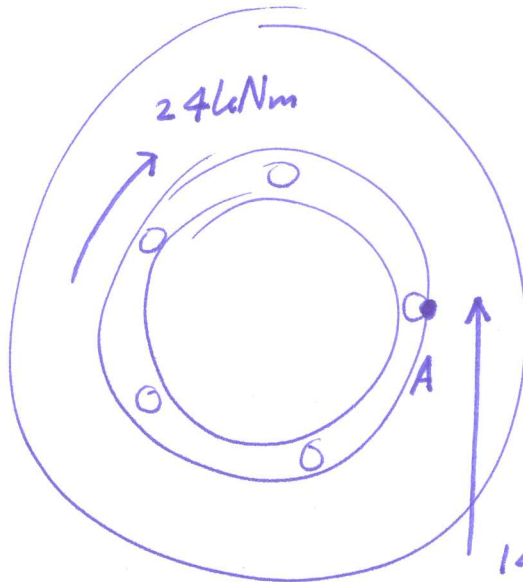


FREE BODY DIAGRAM



SHEAR DUE TO (in A)
 TORQUE ①
 VERTICAL REACTION FORCE ②

$$① \quad \tau = \frac{T \times r}{I_p} = \frac{24000 \times 0,1115}{\frac{\pi}{32} (0,223^4 - 0,2^4)} \approx 31 \frac{N}{mm^2}$$

$$② \quad \tau = \frac{P}{A} = \frac{141 \text{ kN}}{\frac{\pi}{4} (0,223^2 - 0,2^2)} \approx \frac{141 \text{ kN}}{0,007641} \approx 18,5 \frac{N}{mm^2}$$

THIS SHEAR COMPONENT INCREASES SHEAR AT LOCATION A

$$\tau_{\text{TOTAL IN A}} = 31 + 18,5 = 49,5 \frac{N}{mm^2}$$